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September 16, 2011

The Bureau of Land Management
Groundwater Projects Office
P.O. Box 12000
Reno, NV 89520-0006

Subject: Clark, Lincoln, and White Pine Counties Groundwater Development Project Draft Environmental Impact Statement

The Nature Conservancy has reviewed the Clark, Lincoln, and White Pine Counties Groundwater Development Project (Project) Draft Environmental Impact Statement (EIS) and wishes to offer the following comments to the Bureau of Land Management (BLM) for your consideration.

The mission of The Nature Conservancy (the Conservancy) is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. To achieve this mission, the Conservancy engages constructively with private landowners, public agencies, local communities and others. The Conservancy's approach is non-confrontational and solution-oriented.

Our comments are crafted in accordance with your suggestions (p ES-1):

- Succinct
- Beginning with general or reference comments
- Moving on to specific document sections, including page numbers
- Clearly stated suggestions and recommendations, with an expectation of what we'd like the agency to do
- Specific, solution-oriented recommendations for environmental mitigation

While the Nevada State Program has taken the lead on this analysis, these comments have been developed in consultation with the conservation staff of the Conservancy's Utah State Program.

General Comments

The Conservancy has identified 23 priority landscapes that collectively capture virtually all of Nevada's ecological systems and over 50 percent of its imperiled species. The significant biological resources at three of these "Last Great Places" in Nevada, along with one priority

landscape in Utah, would be adversely impacted by the Project's proposed long-term, large-scale groundwater withdrawals. These landscapes include: Spring Valley-Snake Range, Steptoe Valley, White River Valley (which also includes Cave Valley) and Snake Valley in Utah. The Conservancy has been engaged in varied conservation action at most of these areas over many years. For example, the Conservancy recently completed a "Landscape Conservation Forecasting" report of conditions and proposed management actions for Great Basin National Park (Spring Valley-Snake Range), under a cooperative agreement with the National Park Service. A map of the Conservancy's Priority Landscapes in Nevada is enclosed.

These landscapes contain significant occurrences of aquatic, riparian, and wetland ecosystems, and dozens of associated species that are globally imperiled. The Conservancy's conservation objective is to ensure the long-term viability of the water-dependent ecological systems and imperiled species by maintaining sufficient groundwater and spring flows at these areas. Spring Valley and the other priority landscapes also support a diversity of wildlife species – fish, waterfowl, upland birds and mammals – that are dependent upon the water resources. These species and places are important to Nevadans who use and love the outdoors.

The EIS has well documented the significant aquatic, vegetation and wildlife resources that would be adversely affected by the Project, by type and by location. These biological resources include perennial springs, streams, ponds, lakes, wetlands and meadows, riparian vegetation, and the associated aquatic, amphibian, and terrestrial species associated with these groundwater-dependent ecosystems. Dozens of these species have some special status for conservation. The Conservancy's ecoregional assessment tallied 37 significant desert aquatic communities, riparian wetland systems or globally imperiled fish or mollusks in the three priority Nevada landscapes.

The Conservancy's comments focus on the impacts to – and the critical need for monitoring, management and mitigation of potential adverse impacts to – the significant biological resources that will result from the groundwater pumping. We do not address environmental impacts from construction and operation of the pipeline and other facilities associated with system operations.

We applaud BLM's use of regional groundwater modeling for the EIS. We have long maintained that a shared, consistent groundwater modeling framework is an essential foundation to manage groundwater use predictively and adaptively. Regional groundwater modeling is an accepted way to account for groundwater data, to predict the impacts of large-scale pumping over time and to compare various pumping scenarios. Our endorsement of the use of groundwater modeling, however, is not necessarily an endorsement of the particular model that was developed by the Southern Nevada Water Authority (SNWA) and used by BLM for the EIS; we have not evaluated the model itself. Also, as called for in the Stipulation Agreements between SNWA and federal agencies, the regional groundwater model that is ultimately used

for monitoring, management and mitigation must be agreed upon by all of the parties to those Agreements, not simply SNWA and BLM.

We also applaud BLM's efforts to link the results of the groundwater flow modeling to predicting potential impacts to groundwater-dependent biological resources, such as springs, streams, wetlands, meadows and their associated special status species. The groundwater flow model was used to predict the reductions in groundwater elevation, flow changes in selected springs and perennial streams, reductions in evapotranspiration from vegetation, where these reductions would occur, and the degree of impacts on selected aquatic and biological resources. A 10 foot or greater drawdown in groundwater levels was used by BLM as a threshold for predicting adverse impacts and risks to the groundwater-dependent ecosystems. While this may be a reasonable starting point, adverse impacts to many important groundwater-dependent ecosystems and species could occur at much smaller water level declines. BLM cites that "drawdowns of less than 10 feet could reduce flows in perennial springs or streams...which in turn could potentially cause declines in the diversity and abundance of associated riparian flora and fauna that may only be able to tolerate water declines on the order of a few feet." (Chapter 3, p 3.3-87). Therefore, many of the biological impacts can only be inferred by the current coarse-scale groundwater modeling, and could be better assessed with more fully developed ecological models. Springsnails, for example, are highly sensitive to water levels, flows and temperature. The potential impact from groundwater pumping on local springsnail populations, as well as other sensitive aquatic species, could be assessed with finer resolution ecological models that were linked to the results of the regional groundwater models.

Every Alternative proffered by BLM provides for large-scale groundwater pumping. The minimum production (Alternatives D & E) is up to 78,755 acre feet per year (afy), whereas the maximum production is up to 176,655 afy (Proposed Action and Alternative B). Alternative C provides for intermittent pumping in response to climate change and Colorado River water availability, but averages up to ~63,000 afy. Alternative A, which BLM "asks the reader... to use as a starting point in reviewing the Draft EIS," (Chapter 2, p 2-89), provides up to 114,775 afy. Using the regional groundwater model, the EIS clearly forecasts the impacts in near-surface groundwater levels and spring flows at those areas that are likely to be impacted by pumping under the various Alternatives.

Under each Alternative, the stress to groundwater-dependent ecosystems and associated species caused by the proposed long-term groundwater withdrawals in the Project area will likely propagate over hundreds of miles and hundreds of years. For example, under each Alternative, substantial declines in groundwater levels occur within Spring Valley within 75 years after build-out of the Project (or even sooner). Declines in regional spring discharge would be significant at ecologically important spring complexes. Reduced evapotranspiration from large scale pumping would cause significant impacts on local springs, wetlands and

riparian areas. Fish and aquatic species would be adversely affected by the large-scale pumping.

Indeed, these impacts will continue even after pumping cessation, as explained in Appendix F3.3.5. The groundwater flow model was used to evaluate recovery if pumping was terminated after 75 years under Alternative A. The residual drawdown was predicted to persist for as long as 125 years in southern Spring Valley and three other valleys.

All predicted effects to aquatic and biological resources – not unexpectedly – were markedly worse if pumping continued for 200 years after build-out.

Monitoring, Management and Mitigation

The EIS recognizes the critical importance of mitigation measures to address potential adverse impacts of the Project, and asks for “specific, solution-oriented recommendations for environmental mitigation.” (ES-2) BLM asks: “What is the effectiveness of proposed mitigation measures for avoiding (emphasis ours) or reducing the identified impacts?” (Chapter 3, p 3-1).

SNWA has proffered a number of “Applicant-Committed Environmental Protection” measures. These include (1) monitoring, management and mitigation measures provided for under Stipulation Agreements with federal agencies, as well as the requirements of the Nevada State Engineer and (2) adaptive management measures proffered by SNWA. While they serve as a good starting point, these currently committed and proposed mitigation measures are not yet sufficiently developed or specified to assure that unreasonable adverse effects will not occur to the groundwater-dependent resources.

If large-scale groundwater development is to occur under the Project, agreements to monitor, manage and mitigate (“3M” agreements) the potential impacts hold promise for adaptive management of sustainable, ecologically sound groundwater withdrawal. As noted in the EIS (but lacking mention in the Executive Summary), SNWA and federal agencies have entered into “3M” arrangements under their Stipulation Agreements for Spring Valley and for Delamar, Dry Lake & Cave Valleys. These two agreements have many common elements, although some important differences exist.

The Spring Valley agreement includes a specific goal to conserve springs, streams, riparian and wetland ecosystems across a large geographic area that might be impacted by large-scale pumping. Its overarching standard is to avoid “unreasonable adverse impacts” to the groundwater-dependent ecosystems. It also provides for development of ecological models and other tools to help predict potential adverse impacts well before such impacts may be actually measured. It provides for the effectuation of mitigation measures (including redistribution, reduction, or cessation of pumping, as well as improvements to habitat and other measures) if there is a predicted change in a key biological parameter that has the

potential to cause unreasonable adverse effects. It provides for a long-term monitoring plan that includes a well-developed set of baseline conditions.

Indeed, the Conservancy helped facilitate the development of the Monitoring Plans under the Stipulation Agreements, using its Conservation Action Planning methodology as a framework. The Monitoring Plans identified the groundwater-influenced ecosystems and their associated special status biota, as well as the Key Ecological Attributes and Indicators for assessing the condition of each system. Key Ecological Attributes represent the critical factors that will capture the ecosystem's or species' likelihood to persist for a century or longer, including elements such as ecological processes, composition, structure and size. Indicators are what is measured for each key attribute. The attributes and indicators serve as a foundation for determining potential adverse impacts; they were based on the following criteria:

- (1) strongly related to the status of the groundwater-influenced ecosystem and possibly essential to its viability;
- (2) good indicators of ecosystem health, including those that might provide early warning of adverse impacts due to SNWA groundwater withdrawal; and
- (3) reasonably feasible and efficient to measure.

The Conservancy believes that the current monitoring, management and mitigation provisions in the Stipulation Agreements, while a good starting point, are inadequate to assure that "unreasonable adverse effects" will not occur to the groundwater-dependent resources over the duration of groundwater development. The major inadequacies are as follows:

- *Ecological models have not been developed to better determine the impacts* of reduced groundwater levels and flows to the other key ecological attributes of the groundwater-dependent ecosystems, including their significant biota. The Conservancy and federal agency partners now routinely use ecological models to forecast future conditions and the potential effects of alternative management strategies for terrestrial and riparian ecosystems at a landscape-level; we strongly encourage the use of ecological modeling as a management tool. Ecological models – with parameters linked to the predicted groundwater levels, spring and stream flows, and vegetation evapotranspiration from the agreed regional groundwater model – could allow the forecasting of adverse impacts well before they might occur, as well as testing a variety of mitigation management strategies in advance of any actual impacts.
- *No standard has yet been established for what actually constitutes an "unreasonable adverse impact."* The Conservancy commonly uses a standard that the Key Ecological Attributes for an ecological system or species should fall within an acceptable range of natural variation for the system to be considered viable, recognizing that some management actions may still be required to maintain the system. If such a standard were deployed, then any predicted movement of an indicator or a suite of indicators

outside of the acceptable range of variation might be considered an “unreasonable adverse impact” – whatever the cause, be it groundwater withdrawal or other management practices affecting the ecosystem.

- *No ecological thresholds have been determined* that would translate a standard of “unreasonable adverse impact” into measureable indicators for the various groundwater-dependent ecosystems. The EIS implicitly suggests that a predicted 10 foot or greater drawdown in groundwater levels (Chapter 3, p 3.3-87) or a 5 percent or greater reduction in predicted spring flows (Chapter 3, p 3.3-92) might constitute such thresholds for two vital attributes – groundwater levels and spring flows. These types of thresholds need to be developed and specified for all Key Ecological Attributes for identified species and ecosystems based upon clearly articulated standards.
- *There are no firm “trigger” mechanisms to assure that sufficient mitigation will occur* based upon predicted unreasonable adverse effects (i.e., when a predicted threshold is crossed). Mitigation measures include redistribution, reduction, or cessation of pumping, as well as improvements to habitat and other measures. Instead, the existing Stipulation Agreements provide for a consultation process among the parties to the Agreements (i.e., SNWA and the federal agencies) to determine what might constitute an unreasonable adverse impact and what mitigation measures, if any, would be required. While we support a consultation process and encourage consensus-based decisions, we believe the presumption should be that mitigation *will* occur unless the parties agree otherwise.
- *There is no clear process for resolving a deadlock* if the parties to a Stipulation Agreement cannot reach a timely agreement about a projected unreasonable adverse impact or a proposed mitigation action. Final decisions are to be made by an Executive Committee, but if the Executive Committee cannot reach agreement there is no clear final arbiter or resolution process.

The EIS acknowledges several of the current deficiencies of the Stipulation Agreements, but does not recommend any measures to assure that these deficiencies will be adequately addressed before a federal Record of Decision is issued. BLM specifically notes ...

“The biological monitoring plans that have been developed to date are strictly monitoring plans (i.e., they lack the mitigation and management component). Thresholds for management action/response have not been identified... It will be important to link monitoring to appropriate management responses and mitigation to avoid unreasonable adverse effects.” (Chapter 3, p 3.7-47)

The additional proffered “Applicant-Committed” mitigation measures – which propose an adaptive management approach – as described in the EIS are wholly inadequate to *avoid*

adverse impacts. The EIS states that “SNWA has developed an Adaptive Management Plan to...establish adaptive management thresholds, conduct monitoring...and determine whether SNWA’s groundwater pumping *has likely caused or contributed to* (italics ours, to emphasize the use of the past tense) adverse environmental impacts, and if so, then to determine the appropriate adaptive management strategy to avoid future adverse environmental impacts and minimize or mitigate those that have already occurred.” (Chapter 2, p 2-44). This approach is unsatisfactory, in that it is *reactive* to environmental impacts that have already occurred (and may be difficult if not impossible to successfully mitigate), rather than *proactive* in using groundwater and ecological models to forecast adverse impacts well before they occur, test alternative management and mitigation strategies, and truly adaptively manage for ecologically sustainable withdrawals.

The Conservancy would be happy to continue playing a facilitative role in building upon the monitoring plans to establish effective adaptive management and mitigation plans.

Major Uncertainties Affecting the Draft EIS and Evaluation of Alternatives

Several key elements will have a major influence on the ultimate environmental impacts of the Project, but are still uncertain at the time of the Draft EIS:

1. The Nevada State Engineer has not yet made a decision on SNWA’s re-filed applications for groundwater withdrawal in Spring, Cave, Delamar and Dry Lake Valleys. Therefore the actual amount of approved groundwater withdrawal, if any, is uncertain.
2. The States of Nevada and Utah have prepared a *draft* agreement regarding the allocation of groundwater in Snake Valley, but this agreement remains un-signed by the states. Moreover, there will be no Snake Valley decision by the Nevada State Engineer on SNWA withdrawal applications until 2019 at the earliest. Therefore, any consideration of withdrawals from Snake Valley at this time is highly speculative.
3. The Stipulation Agreements between SNWA and various federal agencies for Spring Valley and Delamar, Dry Lake and Cave Valleys still lack clear standards, methods and processes for assuring mitigation of any predicted unreasonable adverse effects on groundwater-dependent resources, as we have described above.
4. No 3M agreement even yet exists for Snake Valley (only a proposed agreement by BLM), if indeed any withdrawals were to be approved and pumping were to occur there.

Conservancy Recommendations

BLM states that it is “mandated by law to grant certain ROWs [rights of way]” (ES-14). However, the Conservancy believes that the circumstances surrounding the currently proposed

Alternatives are far too uncertain (as described above) to reasonably evaluate them, other than to conclude that each Alternative other than No Action is likely to produce unreasonable adverse effects on significant biological and environmental resources. Moreover, we maintain that some Alternatives are beyond the scope of being reasonable, in that they assume withdrawal amounts well beyond the levels already granted by the Nevada State Engineer. Lastly, any Snake Valley withdrawal amounts as of this date are completely speculative.

The Conservancy therefore recommends that the Alternatives considered under the EIS be amended, as follows:

- The Proposed Action and Alternative B should be discarded, as they are based on an unreasonable assumption about the amount of groundwater pumping – an amount substantially in excess of the amounts previously approved by the Nevada State Engineer.
- Alternatives D and E should be amended to reflect the new amount of SNWA withdrawals, if any, that are approved by the Nevada State Engineer in the upcoming proceedings.
- Alternatives A and C should be discarded, as they are based on a highly speculative future withdrawal amount from Snake Valley being approved by the Nevada State Engineer – with the SNWA application postponed until 2019, with a still unsigned bi-state agreement and with no 3M provisions under a signed agreement.
- One or more new Alternatives should be developed, based upon a substantially lower level of pumping, assuming that cessation and/or reduction of pumping will be required over the project's lifespan to avoid the types of adverse environmental impacts so well documented in the EIS. This would be a reasonable effectuation of the monitoring, management and mitigation plans under the existing Stipulation Agreements, which explicitly provide for cessation or reduction of pumping as a mitigation option. BLM has already shown its willingness to consider variable and intermittent pumping levels under current Alternative C.

Given the types, levels and extent of environmental impacts predicted in the EIS, the Conservancy recommends that monitoring, management and mitigation measures be more fully developed and specified under any Alternative, including the following provisions:

- A clear standard be established for what constitutes an “unreasonable adverse impact.”
- A requirement that ecological models be developed to better forecast the impacts of reduced groundwater levels and flows to the Key Ecological Attributes of the

groundwater-dependent ecosystems that have been developed in the Spring Valley and Delamar, Dry Lake and Cave Valleys Monitoring Plans.

- A requirement that ecological thresholds be determined that would translate a standard of “unreasonable adverse impact” to measurable indicators for the groundwater-dependent ecosystems (indicators have already been established for each Key Ecological Attribute under the Monitoring plans).
- Establishment of firm “trigger” mechanisms to assure that mitigation will occur, including cessation or reduction of pumping if necessary, based upon any *predicted* unreasonable adverse effects (i.e., impacts that cross the above thresholds as may be forecast by the regional groundwater model and/or ecological models).
- Establishment of a clear process for resolving a deadlock in the event that the parties to a Stipulation Agreement cannot reach a timely agreement on management or mitigation actions.

Thank you for the opportunity to comment on the Draft EIS, and we look forward to your response to our and other public comments.

Sincerely,



Kathryn Landreth
Nevada State Director



Dave Livermore
Utah State Director

Enclosure: Map of The Nature Conservancy's Priority Nevada Landscapes

Cc: Board of Trustees, The Nature Conservancy in Nevada
Board of Trustees, The Nature Conservancy in Utah

Priority Landscapes

The Nature Conservancy in Nevada

